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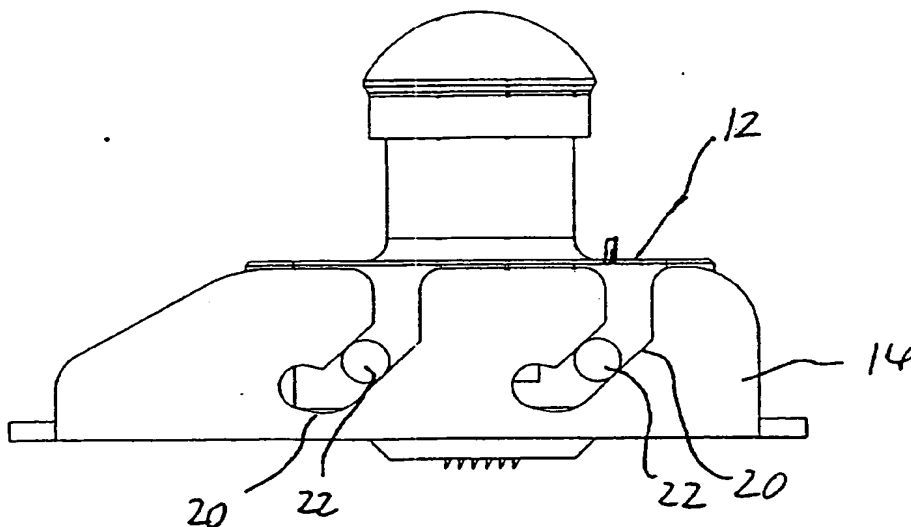
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(54) Title: **DEVICES AND METHODS FOR TRANSPORTING FLUID ACROSS A BIOLOGICAL BARRIER**



(57) **Abstract:** A device (10) and method for transporting fluids across biological barriers enhances penetration of a biological barrier by the use of directional insertion, preferably with asymmetric microneedles (18) and/or microneedles (18) with sharp edges. Additionally, or alternatively, adhesion followed by alteration of contact geometry is employed to stretch the biological barrier across the microneedles (18), thereby also enhancing penetration. Also disclosed is a device (10) and method which combine shallow penetration by hollow microneedles (18) with jet injection via the microneedles (18) to achieve a total liquid penetration depth greater than the mechanical penetration depth of the microneedles (18).